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SEALING DISC AND FILM COMPOSITE FOR A CLOSURE OF A
CONTAINER

BACKGROUND

1.0 Field of the Disclosure

The present disclosure is directed to a cap for a container closure and, in particular, to a cap with a sealing disc.

2.0 Related Art

On the closure of a container it is frequently desirable, or even necessary, to provide the container mouth with a disc-shaped closure which seals off the contents, for example, liquids or else substances such as foodstuffs.

There are several reasons why the sealing off is required. On the one hand, the contents are to be protected against outside influences, for example, against water vapor or oxygen. On the other they are also to remain aroma-tight. There is a further reason in the case of aggressive contents, for which leakage protection must be optimized. Finally, an originality protection for the trade also may be provided by such a sealing off, because a user is able to recognize immediately whether someone has already handled the container contents beforehand.

In addition, the container closure is then also sealed with a screw cap or a similar element, which ensures a mechanical and stable sealing outside the film. On initial use the user destroys the film in order to obtain access to the contents of the container. The user may then close the container afterwards (unless he has already removed the entire contents) with the screw closure, which may provide a temporary seal for the opened contents for a suitably short period of time.

1 The film that seals the container contents is frequently applied by
2 induction sealing. A complete sealing disc is put on for this purpose, having a
3 bottom layer that forms the sealing layer. Above the sealing layer lies a second
4 layer, generally aluminum, which serves for the generation and transmission of
5 heat during the induction process and optionally forms an additional mechanical
6 protection. The second layer is firmly connected to the first layer and in particular
7 favorably for the transmission of heat. Above the second, aluminum layer are
8 further components of the sealing disc, which remain in the cap after opening the
9 screw or other rotating closure.

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11 The removal of the film is irksome for the user in certain circumstances,
12 which may require a tool, for example, a knife or a pair of scissors. Use of a tool
13 leads to the risk that parts of the film will thereby fall into the container contents.
14 In addition, a suitable tool is not always at hand. Screw closures already exist
15 with an outside so formed that when used the other way round they permit a
16 partial cutting or tearing of the film here. This makes the screw cap more
17 expensive, and it is also necessary to give the user suitable instructions on the
18 method, so that he may carry out the opening correctly.

19
20 It has also already been proposed as an alternative, for example in
21 EP 0 697 345 A2, that the sealing disc, or at least the film composite, be provided
22 at its edge with suitable projections or tabs, which the user may grasp, thus
23 allowing the user, supported in this way, to easily remove the sealed-on film. The
24 extremely practical construction may not be used in every case, however, because
25 the projecting tabs must, after the positioning of the screw cap, be able to be
26 arranged between the screw thread and the outside of the container opening, a fact
27 which may lead to geometrical difficulties. It is also problematical if, for
28 example, the upper parts of the sealing disc must not exhibit any lugs, because this
29 prevents their retention in the screw cap part. Two separate punching operations

1 would then have to be provided for the film composite and the upper parts of the
2 sealing disc, which leads to further costs.

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4 It has therefore been proposed in EP 0 395 660 B1 and EP 0 534 949 B1
5 that the sealed-on film composite be constructed of two layers that are bonded to
6 one another over roughly half of their area, while the other half remains free. This
7 results in easy detachment of the half of the upper layer that is not bonded,
8 whereas the other area remains connected during the detachment. If such a two-
9 layered, partially bonded film composite is used on the container, the user simply
10 has to grasp the admittedly flatly positioned but easily detachable half of the upper
11 layer, and is then able to remove the whole of the film composite by exerting a
12 suitable force.

13
14 This rather striking idea nevertheless has some drawbacks. A mass market
15 product is naturally involved, in which cost considerations play a very great role.
16 A process must therefore be found in which two layers may be connected to one
17 another in such a way that they are only partially bonded. This can be brought
18 about by a relatively laborious strip-wise lamination.

19
20 A further drawback is due to the partially open upper layer, which causes
21 problems during the filling and closing of the containers. If the screw closure is
22 applied with rotation, the latter has a tendency to attack the film by friction. As
23 the upper layer is supported loosely in part, it is on some occasions also pulled
24 slightly here, which may lead immediately to uncontrolled creasing and also to
25 buckling and to destruction. In the container filling industry, however, even
26 minimal wastage rates are extremely undesirable because, as a rule, the whole
27 container then has to be rejected or may lead to complaints.

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1 The flatly positioned fold represents, in contrast to the prior art, additional
2 material and is therefore relatively insensitive. Without an additional punching
3 operation it does not project, even in the flat lying state, completely up to the edge
4 side, but ends before the latter.

5
6 Particularly preferably, the fold is so arranged that it lies off-center. As a
7 result, it will have a tendency to tilt in one direction, without its raising being
8 affected disadvantageously in any way.

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10 In order to simplify the gripping area and the tearing open, the fold should
11 however remain relatively adjacent to the center, so that a division of the overall
12 surface is preferred such that the smaller area occupies a zone of 40% to
13 below 50% of the total area.

14
15 It has proved to be particularly practical for grasping if the fold exhibits
16 a spacing of between 0.5 and 2 cm, in particular between 1 and 1.5 cm, between
17 the fold bottom directly on the sealing film and the fold tip.

18
19 It is also preferable if the adhesive layer is provided at any rate in the area
20 of the upper layer that forms the fold. In this way there will be formed in the zone
21 a contacting of adhesive layer to adhesive layer within the fold, which increases
22 and improves the stability and firm bonding of the latter enormously. This has a
23 corresponding effect on the tearing and tensile strength and also prevents the fold
24 from bulging or swelling in a roughly oval shape due to external effects.

25
26 It is particularly preferable, finally, if the adhesive layer occupies the
27 whole area of the upper layer. This is of advantage in production engineering
28 terms; the stripwise lamination known from the prior art, with partial provision
29 and partial omission of an adhesive layer, is especially complicated, in fact, and

1 the full area bonding furthermore also improves the stability and the adhesion of
2 the entire film composite.

3
4 Furthermore, it is advantageous if the whole area of the sealing film is
5 slightly greater than the opening to be covered, including the peripheral edge.

6
7 This very slightly projecting amount of material makes it easier to pull the
8 edge upwardly when grasping the fold. A quite small edge area is created, in fact,
9 which is not be grasped from behind, but which during the raising of the fold is
10 on the peripheral edge of the opening of the container without direct adhesion, and
11 thus favorably influences the tearing process. The projecting edge is on the other
12 hand of such small proportions that it is significantly smaller than, for example,
13 the tabs from EP 0 697 345 A2, and in no circumstances comes into contact with
14 the screw cap.

15
16 The foregoing object is achieved in the case of a sealing disc by the fact
17 that the lower layers of the sealing disc include the film composite according to
18 one of the above combinations of features.

19
20 Such a sealing disc possesses all the above-mentioned advantages. It is
21 perfectly possible to incorporate the layer forming the fold, together with the fold,
22 immediately in the production of the sealing disc, and then to use the complete
23 component in this way in the packaging industry.

24 25 BRIEF DESCRIPTION OF THE DRAWINGS

26 An embodiment of the disclosure will be described in detail below with
27 reference to the drawings, in which:

28 FIG. 1 shows a diagrammatic perspective view of a container with a first
29 form of execution of the sealing film;

FIG. 2 is a diagrammatic section through the sealing film from FIG. 1; and
FIG. 3 is a diagrammatic section through a sealing disc with a sealing film
of corresponding form of execution from FIG. 2.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A container 10 is filled, for example, with foodstuffs or agrochemicals or
other oxygen-sensitive goods, in particular with liquid. Container 10 includes an
opening 11 from which the contents are to be removed at a given time. The
opening 11 is surrounded by a peripheral edge 12.

Opening 11 is sealed by a film composite 30. Above film composite 30
is also located a screw cap (not shown), with which, even if film composite 30 is
destroyed, the container may be sealed at least temporarily. The screw cap also
serves to protect film composite 30 against mechanical influences from outside.

Film composite 30 includes in particular three film layers and two
adhesive layers, as shown in FIG. 2. A first or bottom-most layer 34 is in the
sealed-on state fixed exactly on the peripheral edge 12 of the container 10. On
first layer 34 is arranged an adhesive layer 35, which connects first layer 34 firmly
to a second layer 31. Second layer 31 is an induction film, in particular of
aluminum. If second layer 31 is heated by induction, the heat is transferred to first
layer 34, thus sealing layer 34 firmly on edge 12.

A further adhesive layer 32 is provided on the second layer 31, which is
the induction film. Second adhesive layer 32 continuously connects layer 31 to
upper-most layer 33.

Layer 33 includes a fold 40. Layer 33 is planar outside the area of fold 40
and is connected to underlying layer 31 continuously by the adhesive layer 32. In

the area of fold 40, the whole of layer 33 is laid double starting from fold bottom 41 and extends like this up to fold tip 42, and from there back again to fold bottom 41. Between the two doubly laid material components of upper layer 33 is also located adhesive layer 32, and preferably likewise two-fold. This can be brought about at the manufacturing stage by upper layer 33 being coated with adhesive layer 32 over its whole surface while still in the unfolded state, and then during the line manufacture being bent onto layer 31 of the induction film with the addition of the fold. Thus, fold 40 is particularly stable, and because of the dual adhesion, also bonded particularly firmly into itself. It may nevertheless have a light and filigree effect, for example, because of the fact that the whole of layer 33 is made of a transparent material.

Fold 40 extends diagonally across the film at right angles to the drawing plane. The distance between fold bottom 41 and fold tip 42 is constant here, optionally with bevels or curves in the edge area. The fold tip therefore forms a substantially straight line.

The effect that the whole of this has can be seen in FIG. 1. The whole of the container mouth or opening 11 of container 10, which mouth or opening 11 is covered by film composite 30, is at the same time provided just off-center with fold 40, which rises upward from fold bottom 41 lying exactly in the plane of opening 11 of container 10. Fold 40 is shown slightly inclined, the reason for which is that it lies completely flat in the packed state, occupies little space in this way, and also offers no opportunity for gripping by the screw cap during the screwing on.

FIG. 3 shows diagrammatically a complete sealing disc 20, of which the film composite 30 with its three film and two adhesive layers 31, 32, 33, 34 and 35 together with fold 40, forms the bottom-most part.

1 The upper portion may be a polyamide layer or another polymer.

2

3 Use is possible for all containers, glass, PET, PAC, PP, PVC. The sealing
4 layer beneath the aluminum induction film layer 31 is adapted to any material of
5 the container.

6

7 The end consumer is provided with an outstanding quality, a construction
8 that can be opened easily by means of the projecting fold, which also opens
9 reliably and does not tear.

10

11 The filler or packaging manufacturer is presented with the advantage that
12 such a sealing film or such a sealing disc may be used particularly reliably without
13 problems during the charging operation having to be anticipated.

14

15 The manufacturer of the sealing film is presented with the advantage that
16 he longer has to carry out strip lamination, but is concerned exclusively with
17 materials covering a whole area.

18

19 The fold 40 is not formed until the punching stage. A suitable tool of a
20 punching tool is set so that the whole-area material arrives suitably folded.

21

22 What is claimed is:

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